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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/743,806

12/24/2003

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12/24/2008

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EXAMINER

DINH, DUC Q

ART UNIT

PAPER NUMBER

2629

MAIL DATE

DELIVERY MODE

12/24/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/743,806 | Applicant(s) YOSHIHARA ET AL. | |
| | Examiner DUC Q. DINH | Art Unit 2629 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8,10-12 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10-12 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/16/08 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3-8, 10-12 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Lim et al. (U.S Patent No. 7,053,880), hereinafter Lim.

In reference to claim 1, Lim discloses a field-sequential type display device for performing a display by synchronizing successive switching of lights of a plurality of colors to be incident on a display element with light control in said display element based on display data of each color corresponding to an image to be displayed (col. 1, lines 12-21) , comprising:

a detecting unit (120 of Fig. 7 and ST 1 of Fig. 9) for detecting a maximum grayscale level of the display data for each color (the maximum grayscale level of each color is detected to obtain the average value Ra, Ga and Ba see col. 8, lines 47-55); and

an adjusting unit (120 of Fig. 7 and ST 2 of Fig. 9) for adjusting, individually independently for each color, an intensity of light incident on said display element and a light control variable in said display element, based on the respective grayscale level of each color detected in a detection result for each of said detecting unit (col. 8, line 55 – col. 6, lines 6).

In reference to claim 3, Lim discloses wherein said detecting unit detects a grayscale level of maximum brightness of the display data in a predetermined period, and, when obtaining the maximum brightness, said adjusting unit adjusts the light control variable in said display element so as to have maximum transmittance or reflectance of incident light on said display element and adjusts the intensity of incident light according to the adjusted light control variable (see col. 8, lines 49-65).

In reference to claim 4, Lim discloses that when obtaining brightness of a grayscale level other than the grayscale level of maximum brightness, said adjusting unit adjusts the light control variable in said display element.

In reference to claim 5, Lim discloses wherein an intensity of light incident on said display element after adjusting the intensity of light and the light control variable by said adjusting unit is smaller than an intensity of light incident on said display element without performing the adjustments (col. 8, line 65- col. 9, line 1).

In reference to claim 6, Lim discloses wherein an incident region of light to be incident on said display element is divided, and the detection of a grayscale level by said detecting unit and the adjustments of the intensity of light and the light control variable by said adjusting unit are performed for each of the incident regions (see Fig. 10, col. 41-61).

In reference to claims 7 and 8, Lim discloses wherein said display element is a liquid crystal display element and wherein a liquid crystal material used in said liquid crystal display element has spontaneous polarization (see Fig. 1 col. 2, line1-14 and col. 7, line 60 - col. 8, line 5).

In reference to claim 10, Lim discloses wherein the lights of a plurality of colors to be incident on said display element are red light, green light, and blue light (see Fig. 9 at ST2).

In reference to claim 11, Lim discloses wherein the lights of a plurality of colors to be incident on said display element are red light, green light, blue light, and white light (see col. 8, lines 57-60).

In reference to claim 12, Lim discloses a converting unit for converting red, green and blue display data into red, green, blue and white display data, wherein said detecting unit detects grayscale levels of display data obtained by said converting unit (input values of each sub-frame are converted by the image signal processor. That is, when the average luminance of R_a , G_a , B_a greater than the grey level 128, the light source corresponding to the component having a larger average luminance with be turned on at the fourth sub-frame; see col. 8, lines 49-65).

In reference to claim 14, Lim display method for performing a field-sequential type display by synchronizing successive switching of lights of a plurality of colors to be incident on a display element with light control in said display element based on display data of each color corresponding to an image to be displayed (see rejection of Claim 1), comprising:

detecting a grayscale level of the display data for each color (see steps ST1 and ST2 of Fig. 9); and

adjusting, individually independently for each color, an intensity of light incident on said display element and a light control variable in said display element, based on the respective a detection result of the grayscale level of each color respectively (see Steps ST2 and ST3 in Fig. 9 and col. 8, line 43- col. 10, line 40).

4. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lim in view of Sato et al. (U.S Patent No. 7,030,848), hereinafter Sato.

In reference to claim 8, Lim does not disclose a liquid crystal material used in said liquid crystal display element has spontaneous polarization. Sato discloses a liquid crystal display using liquid crystal display material used in the liquid crystal display element having spontaneous polarization (col. 42, lines 45-49).

It would have been obvious for one of ordinary skill in the art at the time of the invention use the liquid crystal material display element having spontaneous polarization in the device of Lim as taught by Sato because it would ensure sufficient light emitting time and achieve more satisfactory display (col. 42, lines 52-55).

In reference to claim 9, Lim discloses the display device can be a reflecting type of Digital light Processing devices (col. 11, lines 25-36) but does not disclose the display element is a digital micro mirror device. Sato discloses liquid crystal display receiving video signal and controlling the intensity of the backlight and a display element based on the receiving display data (see Fig. 4, col. 12, lines 36-54) and the driver circuit can further used for reflective liquid crystal display such as DMD (Digital Mirror Device).

It would have been obvious for one of ordinary skill in the art at the time of the invention to substitute the reflective display device of Lim with the display element is a Digital Mirror Device as taught by Sato as suggested by Yoshinaga (the invention is not limited to liquid crystal element and may be a light receiving type and projection type such as Digital Mirror Device) to provide a reflective liquid crystal display such as DMD to provide good image brightness and contrast, and therefore produces more reliable gray scale patterns for the display system.

Response to Arguments

5. Applicant's arguments with respect to the elected claims 1, 3-12 and 14 have been considered but not persuasive. Applicant argues that "Lim does not teach or suggest "detecting a grayscale level of maximum brightness of the display data of each color" as recited in amended claim 14 and "a detecting unit" for perform this function as recited in claim 1. However, Lim discloses the calculating unit in ST1 detecting the maximum brightness of the display data of each color R, G and B for obtaining the average luminance values R_a , G_a and B_a of each component R, G and B in calculated

step ST1, and adjusting an intensity of light based on respective grayscale level of each color detected in the detecting unit (see Fig. 9, col. 8, line 5 through col. 9, line 40.

The rejection, therefore, is maintained.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUC Q. DINH whose telephone number is (571)272-7686. The examiner can normally be reached on Mon-Fri from 8:00.AM-4:00.PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, AMR A. AWAD can be reached on (571)272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Duc Q Dinh/

Examiner, Art Unit 2629